

THE BENEFITS OF CLIMATE CHANGE POLICIES

ANALYTICAL AND FRAMEWORK ISSUES

EXECUTIVE SUMMARY

In recent climate policy assessments and debate, too little attention has been given to estimation of the *direct benefits* of greenhouse gas mitigation – that is, the benefits of avoiding climatic change and reducing the likelihood of any ensuing net adverse impacts. The problem is partly relative lack of research and partly lack of synthesis of research into some coherent measure or set of measures for policymakers and the public to understand and weigh benefits.

What can be meaningfully conveyed to policymakers about the direct benefits of climate policy? This volume considers this question through a series of review papers. The goal was not to come up with new, monetised or even physical estimates of direct benefits, but rather to survey available information to work towards an eventual framework and set of priorities for future work, which over time could improve accounting for benefits to facilitate decision-making on international policies.

A number of specific challenges are underscored in this collection of papers, which points to large uncertainties in estimates of impacts or of monetised benefits. There are several reasons for this, including that many categories of impacts have not been researched at a global scale. In addition, socio-economic baselines for impact studies sometimes are not consistent with those emissions driving the climate change projections and adaptation is sometimes not included, or may be assumed to be unrealistically effective and the costs of adaptation are sometimes not tabulated. Further, impact assessments generally only examine responses to changes in mean climate, not those associated with changes in variability or extreme events, or with the risk of non-linearities, abrupt changes and “surprises.” Finally, different types of impacts are fundamentally incomparable, such as changes in human health risks versus species extinctions, and monetizing and aggregating them may be misleading.

Another challenge is that impacts vary across economies, and across market and non-market systems and a range of subjective and technical judgments are embedded in any choice of assumptions to monetise and aggregate benefits across time and space. Any choice of assumptions may be controversial, if not carefully constructed to reflect the views of those affected.

In addition, the benefits of mitigation policies are likely to be experienced by different populations than those that pay for the mitigation, with the differences of distribution spread over both time and space. These differences will affect how various people view what policies are appropriate.

A broad conclusion is that sound summary estimates of benefits in a single (monetary) measure, as might be sought to compare with aggregate costs, may not be adequate on their own to inform policy decisions, especially given the incommensurable nature of benefits. Thus, benefit-cost methods alone may be inadequate to resolve many of these problems and would be usefully complemented with risk-based methods, such as probabilistic approaches to consider climate change and related impacts across a range of possible futures. Such a dual approach also calls for the presentation of benefits information in at least two different forms, using different monetary and non-monetary metrics of change: monetised estimates and physical impact estimates.

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To improve information for policymakers it is also desirable to develop a coherent set of indicators that present a balance of the physical and economic metrics of change. Preferably this would include information at the local, regional and global scales, and would be structured to provide transparency about embedded assumptions when viewing any particular set of estimates. More systematic research and discussion of benefits would allow more explicit, transparent consideration of them in policy dialogue and decisions. However, much work will be needed to make available reliable global, aggregated estimates of the benefits of climate policies. A more modest and preliminary goal should be to have some consistent and comparable regional information against which to assess impacts associated with various levels of global mitigation.

Despite the uncertainties and incommensurable nature of benefits and impacts, some general patterns emerge when looking across the literature on global impacts. Some sectors, such as agriculture, may experience net positive impacts globally of a small amount of climate change. However, no research for any sector suggests positive impacts from climate change as temperatures increase beyond certain levels. A consistent pattern of marginal adverse impacts emerges across all sectors for which data were available beyond a 3-4 °C increase in global mean temperature – translating into possible large and positive net benefits to mitigation policies that can limit climate change to this level or possibly below it.

In addition, results from a number of studies suggest that accounting for the risks of irreversible, abrupt change – risks that grow with forcing of the climate system and with the pace of climate change – is likely to increase the economically “optimal” level of mitigation, calling for more investment in abatement in the near-term.

Looking forward, a conceptual framework for future work emerges here with the aim to help improve information on global and regional avoided impact benefits and to support mitigation policy decisions. The main elements of the framework include a portfolio of indicators of change, first in physical units and at the sub-global scale, before moving onto monetised and aggregated benefits assessment. The framework suggested here is necessarily partial, with emphasis on mitigation and direct climate impacts elements of any more comprehensive framework. By setting out an initial framework to structure further work, it is hoped that impacts research can be used to inform not just adaptation policy but also mitigation policy decisions by helping to assess the trade-offs associated with different global mitigation pathways.

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